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**In paragraph 4 of the office action, claims 30 and 35 were rejected under 35 U.S.C. 112, sec nd paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

5           Claims 30 and 35 have been amended according to the instruction of the Examiner in paragraph 4 of the office action. Claims 32 and 38 have been amended as per the Examiner's suggestion in paragraph 4 of the office action.

**In paragraph 5 of the office action claim 39 was objected to under 37 CFR 1.75 as being a substantial duplicate of claim 40.**

10           Claims 39 and 40 have been cancelled, without prejudice.

**In paragraph 7 of the office action, claims 1-2, 32 and 38 were rejected under 35 U.S.C. 102(b) as being anticipated by Enomoto '229.**

15           Claims 1, 32 and 38 have been amended so as to recite that the vulcanization is performed using a non-contact energy source. Enomoto employs a heated salt bath, i.e., a contact heater. As such, amended claims 1, 32 and 38 are patentable. Claim 2, dependent on claim 1, is also patentable. Reconsideration of claims 1-2, 32 and 38 is requested.

20           **In paragraph 8 of the office action, claims 32, 35, and 38-40 were rejected under 35 U.S.C. 102(b) as being anticipated by Torghele '815.**

As amended, claims 32 and 38 are patentable because Torghele is a contact heater. In fact, a lubricant must be used to pass the hose through the tubular bodies of Torghele  
25   See, col. 4, ln. 9 et seq. wherein the lubrication process is discussed. Claim 35 is dependent on claim 32 and is thus also allowable. Claims 39 and 40 have been cancelled. Applicant respectfully disagrees with the statement of the Examiner that the reference Torghele is a contact heater because the specification describes use of lubricants

throughout the tubular bodies to facilitate passage of the pressurized hose against the walls of the contact heater. Reconsideration of claims 32, 35 and 38 is respectfully requested.

5        **In paragraph 10 of the office action claims, 3, 9, 11-12, and 34 were rejected under 35 U.S.C. 103 (a) as being unpatentable over Enomoto in view of Satzler '039.**

In regard to claim 3, it is patentable because claim 1 is allowable.

10        In regard to claim 9, Enomoto does not depict the tube having a valve. It is respectfully suggested that the Examiner has mistaken the threaded interconnection of the fitting which supplies the air as a valve. Neither Enomoto nor Satzler remotely suggest a valve or a check valve.

In regard to amended claim 11, neither Enomoto nor Satzler suggest vulcanizing using a non-contact heater.

15        Claim 12, dependent on claim 11, is also allowable. None of the references cited suggest vulcanization at a temperature of between 220-350 degrees Fahrenheit.

Claim 34, dependent on claim 33 which in turn is dependent on claim 32, is allowable. None of the references suggest a valve or a check valve as stated above. None of the references suggest a non-contact vulcanizing heater or energy source.

Reconsideration of claims 3, 9, 11, 12, and 34 is respectfully requested.

20        **In paragraph 11 of the office action, claim 13 was rejected under 35 U.S.C. 103(a) as being unpatentable over Enomoto and Satzler as applied to claim 11 and further in view of Borsvold '796.**

Claim 13 is patentable. First there is no suggestion in any of the references to

combine Borsvold in combination with Enomoto and/or Satzler. Second, Borsvold does not teach or suggest vulcanizing from the outside-in by use of a non-contact steam drum. The lead bearing hose is wrapped around the steam drum 40 which means that heating of the hose will be uneven at the point of contact. Applicants respectfully submit that the type of vulcanizing means is, in fact, very important. Vulcanizing with a non-contact heater while under pressure substantially eliminates nicks, cuts or scrapes in the hose because the hose never touches the heater. See, pg. 6, lns. 9-10 of the specification.

**In paragraph 12 of the office action, claim 17 was rejected under 35 U.S.C. 103(a) as being unpatentable over Enomoto in view of Satzler and Tanaka '905.**

Claim 17, as amended, is patentable. There is no suggestion to combine the references as proposed. Applicants invention is designed for the rapid production of hose at 1200 feet per hour while Enomoto is designed to produce hose at a rate of 980 mm/min which is approximately 1 yard per minute which is approximately 180 feet per hour. The rapid rate of production is enabled in part by the non-contact heater. Enomoto is a different process which is directed toward manufacture of braided hose. Likewise, Satzler is directed toward a braided hose. In both Satzler and Enomoto, braiding is performed at or near the extruder whereas in claim 17 the woven fabric has been previously manufactured. Enomoto and Satzler are directed toward production of hose which is supposed to maintain its round shape whereas the hose of the instant invention is a lay flat hose. It is understood from reading the instant specification that the woven fabric of applicants' invention has been previously manufactured. Reconsideration of the

claim is respectfully requested.

**In paragraph 13 of the office action, claim 18 was rejected under 35 U.S. 103(a) as being unpatentable over Enomoto, Satzler and Tanaka as applied to claim 17 and further in view of Torghele.**

5

Claim 18, dependent on claim 17, is patentable for the reason that claim 17 is patentable. Further, Torghele does not disclose a supply cup as suggested by the Examiner. Reference numeral 4 of Torghele is a coupling, not a supply cup. Reconsideration of claim 18 is requested.

10

**In paragraph 14 of the office action, claims 33, 36 and 41-42 were rejected under 35 U.S.C. 103(a) as being unpatentable over Enomoto.**

15

Claim 33 is dependent on allowable amended claim 32. Further, as stated above and reiterated here, Enomoto does not teach or disclose a valve or a check valve in a mandrel. A fitting is depicted in Fig. 2, not a valve.

In regard to claim 36, dependent on allowable claim 32, a prima facie rejection has not been made since no art has been identified that teaches or suggests controlling the diameter of the hose.

20

In regard to claims 41-42, they are allowable as amended claim 38 is allowable. Further, Enomoto does not teach or disclose vulcanizing times and or temperatures and there is no showing that these parameters are within the purview of the skilled artisan or are disclosed in the reference. As such, no prima facie case of obviousness has been made.

Reconsideration of the claims 33, 36 and 41-42 are respectfully requested.

**In paragraph 15 of the office action, claims 1-2 were rejected under 35 U.S.C. 103(a) as being unpatentable over Dougherty '921 in view of Tanaka.**

It is respectfully suggested that there is no suggestion to combine these two  
5 references. As understood, Dougherty discloses a wrapping which surrounds various  
layers of tie gum and an extruded tube. The hose with the wrapping on it is then  
vulcanized by applying heat to the external, internal, or both surface of the hose by  
contact with steam, hot air, hot liquid, or any other processes known in the art. The  
reference clearly discloses contact heating of the wrapping. There is no suggestion in the  
10 reference to combine the woven jacket of Tanaka with Dougherty because Dougherty  
does not admit to the combination given the construction of the hose.

Reconsideration of claims 1-2 is respectfully requested..

**In paragraph 16 of the office action, claims 1 and 4 were rejected under 35  
U.S.C. 103(a) as being unpatentable over Torghele in view of Tanaka and Enomoto.**

15 First, there is no suggestion to combine the teachings of Torghele, Tanaka and  
Enomoto. Torghele teaches vulcanization by a contact heater that has three tubes.  
Enomoto teaches curing of a braided hose. Tanaka teaches injection of a synthetic  
material onto the surfaces of a reinforcing member. None of these references teach or  
20 suggest a non-contact energy source and heater as is recited in amended claims 1 and 4,  
respectively.

In regard to paragraph 17, claim 7 was rejected under 35 U.S.C. 103(a) as being  
unpatentable over Torghele, Tanaka, and Enomoto as applied to claim 4 and further in

view of Dougherty.

Claim 7 is dependent on allowable claim 4. As stated above there is no suggestion to combine the references as suggested. None of the references, including Dougherty, suggest a non-contact steam heater. See, Dougherty, col. 8, lns. 65 et seq.

5 In paragraph 18 of the office action, claim 41-42 were rejected as being unpatentable over Torghele.

As stated previously no prima facie case of obviousness has been set forth by the Examiner. It is respectfully suggested that the Examiner has not cited any structure or process in the reference setting forth the vulcanizing times or temperatures. Additionally,  
10 claim 41 is dependent on allowable claim 38 as set forth above and claim 42 is dependent on allowable claim 41.

**In paragraph 19 of the office action, claims 11-12 were rejected under 35 U.S.C. 103(a) as being unpatentable over Satzler.**

15 Claim 11 as amended is allowable for the reasons set forth above. Satzler teaches a hot salt bath which contacts the hose as the vulcanization apparatus. Claim 12 is dependent on claim 11 which is believed to be allowable. Reconsideration of claims 11 and 12 is requested.

20 **In paragraph 20 of the office action, claim 13 was rejected under 35 U.S.C. 103(a) as being unpatentable over Satzler in view of Borsvold.**

Claim 13 has been amended to articulate the fact that vulcanization is performed in a non-contact steam heater. The vulcanization of Satzler and Borsvold are so completely

different from each other and the claimed invention there can be no logical reason to combine them. Reconsideration of amended claim 13 is requested.

In paragraph 21, claims 25-29 were rejected under 35 U.S.C. 103(a) as being unpatentable over Satzler in view of Enomoto and Tanaka.

5     ➤ First, there is no reason or suggestion to combine the braiding machines of Satzler and Enomoto with the injector of Tanaka. Secondly, Satzler teaches a braiding machine, not a weaving machine. There is no cloth in Satzler. None of the references even remotely suggest supplying air or an inert gas through a cloth. Enomoto, as stated above, does not suggest any kind of valve in the air supply line. None of the cited art suggests  
10 measuring the outside diameter of the hose. None of the art suggests supplying air intermittently. It is respectfully suggested that no prima facie case of obviousness has been made in regard to paragraph 21 of the office action. Reconsideration of claims 25-29 is respectfully requested as they are believed to be highly patentable.

15     In paragraph 22 of the office action, claim 30 was rejected under 35 U.S.C. 103(a) as being unpatentable over Satzler, Enomoto, and Tanaka as applied to claim 26 above and further in view of Dougherty.

Claim 30, dependent on claim 26, is allowable for the reasons stated above in regard to claims 25 and 26. Claim 30 has been amended. The skilled artisan would learn  
20 nothing from reading Dougherty as a whole insofar as the claimed invention is concerned. Dougherty does not teach non-contact heating or application of an energy source. Dougherty teaches application of steam to the surfaces of a hose. Reconsideration of



claim 30 is respectfully requested.

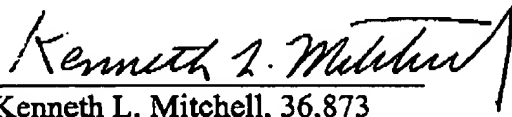
Applicants wish to thank the Examiner for the determination of allowable subject matter as set forth in claims 19 and 20. Applicants also wish to thank the Examiner for her careful review of the application.

5 Applicants also request that the Examiner acknowledge the Request For Correction Of Inventorship filed December 11, 2001. The inventors are Robert Harcourt and John Edward Meadowcroft.

A marked-up copy of the claims is submitted herewith.

10 Please contact the undersigned by phone if any matter in this application can be expedited or if there are any questions.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Title: APPARATUS AND METHOD FOR CONTINUOUSLY AND ENDLESSLY  
VULCANIZING RUBBER HOSE

Serial No. 09/768,024

Filing Date: January 23, 2001

**FAX CERTIFICATION**

*I hereby certify the Marked Up Claims (6 pgs.) were  
faxed to: 703-872-9310 on February 13, 2003.*

*Kenneth L. Mitchell*

Kenneth L. Mitchell, 36,873

Applicants: Harcourt et al.

Assignee: SNAP-TITE TECHNOLOGIES, INC.

Art Unit: 1733

EXAMINER: JESSICA L. ROSSI

Atty Docket No. 8008

**MARKED-UP CLAIMS**

1. (Amended) A process for making [a] hose comprising the steps of:

pressurizing an extruded rubber hose;

trapping air inside said hose; and,

vulcanizing said hose from the outside to the inside using a non-contact energy

source.

2. A process for making hose as claimed in claim 1 wherein said hose includes a

woven jacket.

3. (Amended) A process for making hose as claimed in claim 1 wherein said step  
of trapping air inside said hose is performed by [the] sealing engagement of the hose with

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a mandrel and by [the] sealing engagement of the hose with pinch rollers.

4. (Amended) A process for making hose as claimed in claim 1 wherein said step of vulcanizing said hose from [the] outside to [the] inside includes initially vulcanizing the hose with a first energy source followed by vulcanizing the hose with a non-contact steam heater.

7. A process for making hose as claimed in claim 4 wherein said first energy source is a hot air heater.

9. A process for making hose as claimed in claim 1 wherein said step of pressurizing extruded rubber hose includes supplying air to and through a check valve in a mandrel and into a cavity formed by said check valve, said mandrel, said hose and pinch rollers.

11. (Amended) A process for making [an] extruded rubber hose comprising the steps of:

extruding rubber hose over a mandrel such that said rubber hose forms a seal as said hose exits said mandrel;

tensioning and sealing said rubber hose as it is drawn through pinch rollers by a haul-off; and,

vulcanizing, utilizing a non-contact heater, said hose intermediate said mandrel and said pinch rollers.

12. A process for making an extruded rubber hose as claimed in claim 11 wherein said vulcanization occurs at a temperature of between 220°F - 350°F.

13. (Amended) A process for making an extruded rubber hose as claimed in claim 11 wherein said vulcanizing is performed by a non-contact steam tube [drum].

17. (Amended) A process for making hose comprising the steps of:

extruding rubber onto, into and through a woven fabric forming an unvulcanized  
5 rubber hose;

pressurizing said unvulcanized rubber hose with a gas;

sealing the inside of said rubber hose with respect to a mandrel;

pulling the unvulcanized rubber hose through a non-contact heater vulcanizing said  
rubber hose; and,

10 pinching and sealing said vulcanized hose as it is removed from said heater.

18. A process for making hose as claimed in claim 17 wherein the step of pressurizing said unvulcanized rubber hose with a gas includes intermittently supplying gas under pressure through a gas supply cup to said inside of said rubber hose.

19. A process for making hose as claimed in claim 18 wherein the step of  
15 pressurizing said unvulcanized rubber hose includes intermittently supplying gas under pressure through a gas supply cup, into and through a tube interconnected with said mandrel, and into and through a check valve and into said inside of said rubber hose.

20. A process for making hose as claimed in claim 19 further comprising the step of measuring the outside diameter of the vulcanized rubber hose and varying the  
20 frequency of said intermittent supply of gas to said inside of said rubber hose in response to said measurement of outside diameter of said hose.

25. A process for making hose comprising the steps of:  
feeding woven cloth over a tube and a mandrel;  
supplying gas through said woven cloth, into said tube, and through said mandrel;  
extruding rubber onto, into and through a woven fabric forming an unvulcanized

5 rubber hose;

pressurizing said unvulcanized rubber hose with said gas;  
sealing the inside of said hose with respect to said mandrel;  
pulling said unvulcanized rubber hose through a heater vulcanizing said rubber  
hose; and,

10 sealing said rubber hose as it is removed from said heater.

26. A process for making hose as claimed in claim 25 further comprising the step  
of measuring the outside diameter of said hose upon exit from said heater.

27. A process for making hose as claimed in claim 26 wherein said step of  
supplying gas through said woven cloth and into said tube is performed intermittently at a  
15 frequency necessary to insure the correct diametrical dimensions of said hose.

28. A process for making hose as claimed in claim 27 wherein said frequency of  
supplying air through said woven jacket is increased when said outside diameter is too  
small and said frequency of supply air is decreased when said outside diameter is too  
large.

20 29. A process for making hose as claimed in claim 26 wherein a check valve is  
included in said mandrel and pinch rollers seal said unvulcanized hose as it is removed

from said heater.

30. (Amended) A process as claimed in claim 26 wherein said heater may be selected from the group consisting of a steam heater, an infrared heater, an electric coil, and a hot air heater [or a microwave heater].

5           32. (Amended) A process for continuously vulcanizing hose comprising the steps of:

pressurizing said hose from within; and,

vulcanizing said hose from outside-in using a non-contact energy source.

10           33. A process for continuously vulcanizing hose as claimed in claim 32 wherein said step of pressurizing said hose includes supplying gas under pressure through a check valve located in a mandrel.

34. A process for continuously vulcanizing hose as claimed in claim 33 wherein said step of pressurizing said hose includes sealing said hose about said mandrel and between pinch rollers.

15           35. (Amended) A process for continuously vulcanizing hose as claimed in claim 32 wherein said step of vulcanizing said hose from outside-in is performed by a heater selected from the group of a steam heater, an electric coil, a radiant heater, an infrared heater, and a hot air heater [or a microwave heater].

20           36. A process for continuously vulcanizing hose as claimed in claim 32 further comprising the steps of controlling the diameter of said hose.

38. (Amended) A process for [endlessly] vulcanizing an endless hose comprising

the steps of:

pressurizing said hose from within; and,

vulcanizing said hose from outside-in using a non-contact energy source.

41. (Amended) A process for [endlessly] vulcanizing an endless hose as claimed

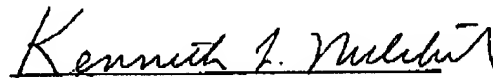
5 in claim 38 wherein said step of vulcanizing said hose from outside-in occurs for 1 to 5 minutes.

42. (Amended) A process for [endlessly] vulcanizing an endless hose as claimed

in claim 41 wherein said step of vulcanizing said hose from outside-in occurs at a temperature in the range of 220-350°F.

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Respectfully Submitted,



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